

1 NON-BINDING ARBITRATION INITIATED 10/21/08

2 PURSUANT TO

3 DECREE OF MAY 19, 2003, 538 U.S. 720

4 KANSAS V. NEBRASKA & COLORADO

5 NO. 126, ORIG, U.S. SUPREME COURT

11 DEPOSITION OF DAVID W. BARFIELD, P.E.,

12 produced, sworn, and examined on Monday, the 23rd day  
of February, 2009, between the hours of 8:00 o'clock  
13 in the forenoon and 6:00 o'clock in the afternoon of  
that day at Husch Blackwell Sanders LLP, 4801 Main  
14 Street, in the City of Kansas City, County of  
Jackson, State of Missouri, before:

15 JANE A. BLACKERBY, RPR, CCR

16 Registered Professional Reporter

of

17 JAY E. SUDDRETH & ASSOCIATES, INC.

Suite 100

18 10104 West 105th Street

Overland Park, Kansas 66212-5755

19  
20 a Certified Court Reporter within and for the State  
of Missouri.

21  
22 Taken on behalf of the State of Nebraska.

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13

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15 Mr. Scott Ross  
Mr. Samuel Speed  
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21

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1                   DAVID W. BARFIELD, P.E.,  
2     of lawful age, having been first duly sworn to tell  
3     the truth, the whole truth, and nothing but the  
4     truth, testified as follows:

5                   DIRECT EXAMINATION

6     BY MR. WILMOTH:

7           Q.     Good afternoon, Mr. Barfield.   How are  
8     you today?

9           A.     Well.

10          Q.     Feeling better, I hope.

11          A.     Better than last week, yes.

12          Q.     It's a pleasure to be with you again.  
13     I'm sure the pleasure is all mine today.   Thank  
14     you for appearing again.   You are an author on at  
15     least three reports I can think of in this case,  
16     or this arbitration.   One dated January 20, 2009  
17     entitled Ensuring Future Compliance by Nebraska.  
18     Are you familiar with that report?

19          A.     Yes.

20          Q.     One dated February 17, 2009 entitled  
21     Kansas's Responsive Expert Report Concerning  
22     Haigler Canal.   For the record that's -- and  
23     Groundwater Modeling Accounting Points.   Is that  
24     correct?

25          A.     That's correct.

1 Q. Are you familiar with that report?

2 A. Yes.

3 Q. And the third report is dated  
4 February 17, 2009, and entitled Kansas's Expert  
5 Response to Nebraska's Expert Report, quote,  
6 Estimating Consumptive -- I'm sorry, Computed  
7 Beneficial Use For Ground Water and Imported Port  
8 Water Supply Under the Republican River Contact,  
9 close quote. Are you familiar with that report?

10 A. I am. I'm a co-author on that report.

11 Q. I'm going to start with the short one,  
12 because it's always easier to deal with the short  
13 stuff early. And if you will bear with me until  
14 our copies come. I'll refer to this as the  
15 Haigler Canal report.

16 A. Okay.

17 Q. And I'd like to have that marked as  
18 Exhibit 9.

19 (Whereupon, Barfield Deposition Exhibit  
20 Number 9 was marked for  
21 identification by the reporter.)

22 Q. (By Mr. Wilmoth) Do you have a copy of  
23 that report?

24 A. I do.

25 MR. DRAPER: What's the date of that

1 report?

2 MR. WILMOTH: This is February 17,  
3 2009. Do you mind if I give you a copy in a  
4 minute, John?

5 MR. DRAPER: That will be fine.

6 MR. WILMOTH: They're making some  
7 for us.

8 Q. (By Mr. Wilmoth) Mr. Barfield, could  
9 you just state for the record your current  
10 position?

11 A. Yeah. I'm chief engineer with the Division  
12 of Water Resources, Kansas Department of Agriculture.

13 Q. And you've been deposed in this matter  
14 once before, have you not?

15 A. That's correct.

16 Q. And in that deposition you accurately  
17 and correctly explained your professional and  
18 educational background?

19 A. Yes. To the extent you asked me, I did.

20 Q. And have you developed any new expertise  
21 or education since that time?

22 A. Not since.

23 Q. All right. So it would be reasonable to  
24 assume that information is still accurate?

25 A. That's correct.

1           Q.     Okay.  Anything that we should know  
2     about today that would potentially impair your  
3     ability to testify truthfully and accurately, any  
4     medication or anything that would present a  
5     problem?

6           A.     I don't think the DayQuil should be a  
7     problem.

8           Q.     Okay.  Not if it's DayQuil.

9           A.     That's right.

10          Q.     With respect to the Haigler report, I  
11     think you'll agree with me that the issue is quite  
12     succinct and constituting a couple of paragraphs.  
13     I was hoping that you could explain to us briefly  
14     your -- the point of this analysis and what you  
15     find defective with the proposal by Kansas  
16     respecting Haigler Canal.

17          A.     The proposal by Nebraska?

18          Q.     By Nebraska, excuse me.

19          A.     Well, principally, as I state in the report,  
20     the proposal is incomplete with respect to accounting  
21     of the impacts of the -- any imports that might exist  
22     between the North Fork and the Arikaree Basins at the  
23     Arikaree River at Haigler.  It essentially assumes in  
24     that analysis that all the spill back water and all  
25     the return flows in the Arikaree Basin arrive at that

1 gauge, which may or may not be the case, and there's  
2 evidence that in dry periods it's not the case, and  
3 also, there's just the matter of whether any of that  
4 spill back is already sort of included in the  
5 assumed, you know, return flows that are at  
6 40 percent.

7 Q. And what is your opinion of that latter  
8 issue? Are the return flows included in the  
9 40 percent?

10 A. I really haven't formed a conclusion, I  
11 guess. I think one of the things that I state in  
12 this is that I think the engineering committee or  
13 some body really needs to look at some of the records  
14 that I have sort of quickly tabulated to arrive at  
15 these opinions and make an assessment of that.

16 Q. So is it -- is there any other situation  
17 that you're aware of, any other sub-basin, for  
18 instance, where this phenomenon occurs?

19 A. Well, Driftwood Creek, I believe, has some  
20 parallel situations in that there's water that's  
21 diverted from the main stem and into the Driftwood  
22 Basin, and you know, must be accounted for in a sort  
23 of similar mechanism, so.

24 Q. How is it done in that instance?

25 A. You know, I haven't gone back to review the



1 detailed accounting in that case, so.

2 Q. Is it your position that anytime this  
3 phenomenon occurs the accounting is inaccurate?  
4 So, for example, with Driftwood Creek, if this  
5 occurs in the Driftwood Creek sub-basin, is the  
6 accounting inaccurate?

7 A. I guess I haven't formulated a position  
8 there. I'm just looking at the data in this case and  
9 saying if we make the assumptions implicit within  
10 Nebraska's proposal, the adjustments to the Arikaree  
11 are improper.

12 Q. With regard to --

13 A. And I think -- excuse me, and I think, also,  
14 to the extent that it's consumed, the accounting in  
15 terms of Nebraska's consumptive use may also be  
16 improper, so.

17 Q. But you don't have an opinion on whether  
18 that's the case, whether it's being consumed or  
19 not?

20 A. Well, I guess the gauge record evidence that  
21 there is, at least in dry periods, something going  
22 on. Because again, if you take Nebraska's procedures  
23 and apply it, it produces negative gauge flows in a  
24 series of six years.

25 Q. Does that ever occur more generally,

1 say, at Hardy? I mean, on a sub-basin, when you  
2 add up the sub-basins, is there ever a similar  
3 phenomenon?

4 A. Not to my knowledge. Of course, the  
5 hydrology here and there are quite different.

6 Q. I guess, though, if that were to occur,  
7 your position would be that the accounting was in  
8 error?

9 A. I'm not sure. I'm just looking at the facts  
10 in this particular instance. I haven't walked  
11 through it.

12 Q. I'm trying to extrapolate the reasoning  
13 with regard to this particular basin elsewhere.  
14 But you haven't done that analysis?

15 A. No.

16 Q. Okay. With respect to the second issue  
17 in this report, that issue relates to the location  
18 of certain groundwater model accounting points?

19 A. Yes.

20 Q. Could you summarize your position with  
21 regard to that issue as reflected in your report?

22 A. Right. Well, again, Nebraska has proposed  
23 moving, I believe it's four accounting points, in  
24 terms of where we extract the groundwater model data  
25 for purposes of the accounting from the current

1 designated locations, in effect, to the locations of  
2 the stream gauges. And it's my position that they  
3 should not be changed. The current locations are  
4 consistent with, you know, the compact and the FSS.

5 Q. And what provisions of the compact and  
6 the FSS do you rely on to make that conclusion?

7 A. Well, again, as quoted in the reports,  
8 Section 3(a)(1) of the accounting procedures, really  
9 Article III of the compact itself that I think  
10 defines the sub-basins as being to their confluence.

11 Q. Is the language of the compact and the  
12 accounting procedures the same in that regard?

13 A. In terms of the definitions of the  
14 tributaries?

15 Q. The definitions of the basins, the  
16 sub-basins, excuse me.

17 A. I guess I'm not fully sure, you know, of how  
18 the language parallels each other, so they're fairly  
19 simply stated in the compact itself.

20 Q. What does the language of the accounting  
21 procedures say about the location?

22 A. Well, again, as I quoted in Section 3(a)(1),  
23 they defined the sub-basins with respect to stream  
24 gauges, but the accounting procedures, I think, in  
25 parallel with the compact language says that there

1 will be adjustments so that uses below the gauges  
2 will be reflected in the tributary. So again, that  
3 to me says that the -- the confluence is the end of  
4 the tributary at the end of the sub-basin and the  
5 proper measuring point for all the compact  
6 accounting, including the groundwater.

7 Q. Is your understanding or your position  
8 that Nebraska is attempting to move these  
9 locations to be in a manner that's inconsistent  
10 with the accounting procedures?

11 A. Yes.

12 Q. Okay. So although the accounting  
13 procedures call for making these measurements at  
14 gauge points, you're suggesting that -- is it this  
15 bolded language at the top here, is a savings  
16 clause essentially that modifies that?

17 A. I believe so. And let me just add to that,  
18 then, we have two different issues here. One is the  
19 surface accounting and one is the groundwater  
20 accounting, and these provisions, you know, apply to  
21 the surface water accounting dominantly. You know,  
22 we do use stream gauges obviously as sort of the  
23 starting of our accounting, but it says that, you  
24 know, where we could quantify actions that are  
25 occurring below that stream gauge as being in the

1 sub-basin, then we'll call it that tributary  
2 sub-basin. With respect to the groundwater modeling  
3 points, we can extract it wherever we want to and  
4 clearly include all the groundwater consumptive uses  
5 for the tributary in the proper tributary. There  
6 isn't the same practical effect that we sometimes  
7 have in the surface water accounting.

8 Q. Okay. I notice about halfway down on  
9 Page 2 you indicate that Kansas does not disagree  
10 with the proposed change in the location of the  
11 accounting point with respect to the North Fork  
12 gate. Is that correct?

13 A. That is correct. That is the one proposal  
14 that Nebraska has made that we don't disagree.

15 Q. And by saying you don't disagree, does  
16 that mean you do agree with it?

17 A. Yes. I think we would support a change.

18 Q. I'm not trying to play a semantic game.  
19 If you have a different definition.

20 A. I think we could support a change,  
21 particularly if Colorado was also supportive.

22 Q. And why is that?

23 A. Well, in this particular case the North Fork  
24 is divided even in the compact language, at least  
25 according to my reading, at the Colorado-Nebraska

1 state line. There are allocations. There's a water  
2 supply determined. There are allocations for the  
3 North Fork in Colorado and then there's a delineation  
4 of the North Fork in Nebraska as being part of the  
5 sub-basin called the North Fork in Nebraska and main  
6 stem. So we see the compact in this case, its  
7 language delineating the basin there.

8 Q. And how does that operate in practice?  
9 What's the practical effect of that accounting  
10 point change?

11 A. In terms of moving -- currently, the North  
12 Fork groundwater model accounting point is at  
13 essentially the confluence between the North Fork and  
14 the Arikaree, I believe. It really only determines  
15 where the consumptive use that the model predicts is  
16 accounted for and which basin it's accounted for. Is  
17 it accounted for in the North Fork or is it accounted  
18 in the North Fork and main stem. It doesn't change  
19 the total depletion, to my knowledge.

20 Q. And if it is shifted, is that -- on a  
21 water accounting basis, is that a benefit to  
22 Kansas?

23 A. This has no impact to Kansas, that I'm aware  
24 of.

25 Q. Okay. So your basic distinction between

1 the North Fork gauge and the other accounting or  
2 the North Fork accounting point and the other  
3 accounting points, if I understand it, is that  
4 that accounting point could be moved because it  
5 would be consistent with the definition of the  
6 sub-basin?

7 A. That's correct.

8 Q. But no other accounting point changes  
9 would be?

10 A. That's my view.

11 MR. DRAPER: Let me just add for the  
12 record it's our position that this should be done  
13 through action of the RRCA, not through this  
14 procedure.

15 Q. (By Mr. Wilmoth) Okay. I'd like to  
16 just talk generally, setting that report aside for  
17 a moment, talk generally about your involvement in  
18 using the RCA groundwater model in the accounting  
19 procedures. What, in your experience, is the role  
20 of the groundwater model?

21 A. Well, it has two purposes. One is to  
22 quantify the impacts of groundwater pumping on stream  
23 flows and thereby to quantify groundwater computed  
24 beneficial consumptive use, and the other is to  
25 determine the import of water supply credit for the

1 state of Nebraska.

2 Q. And the role of the accounting  
3 procedures is what?

4 A. Well, the accounting procedures defines how  
5 the engineering committee on behalf of the compact  
6 administration will go about conducting the compact  
7 accountings.

8 Q. And it's important to conduct the  
9 compact accountings for what reason?

10 A. Well, ultimately, I mean, it's how we  
11 determine each state's -- well, the water supply, the  
12 basin, each state's allocations, each state's  
13 consumptive use and ultimately, each state's  
14 compliance.

15 Q. So there's a distinction between the  
16 groundwater model and the accounting procedures  
17 both in origin and use?

18 A. Well, obviously they're different. The  
19 accounting procedure is the broader document. The  
20 groundwater model is input into the accounting  
21 procedures.

22 Q. There seems to be a source of  
23 disagreement among the states about whether or not  
24 Nebraska is seeking to change the groundwater  
25 model. What is your opinion of that issue?



1           A.     Can you repeat the question?

2           Q.     There seems to be a source of  
3     disagreement among the states about whether  
4     Nebraska is seeking to change the groundwater  
5     model or otherwise contesting the model itself.  
6     Do you have an opinion on that issue?

7           A.     Well, my understanding is they're not  
8     seeking to change the groundwater model itself, but  
9     the accounting procedures, prescription in terms of  
10    how it is used in the accounting.

11          Q.     What do you understand to be the  
12    Nebraska proposed change on the CBCU issue?  
13    That's computed beneficial consumptive use.

14          A.     Let's see if I can state it succinctly.  
15    Well, currently --

16          Q.     Could you please, just for the record,  
17    identify what it is you're reviewing?

18          A.     Yeah. I mean, I have just opened to my copy  
19    of the responsive report that one of the three of you  
20    referenced at the beginning.

21          Q.     And for the record, as soon as our copy  
22    center is done, I'll give that to you as an  
23    exhibit, which will be Exhibit 10.

24                 (Whereupon, Book Deposition Exhibit  
25                 Number 10 was marked for

1                   identification by the reporter.)

2           Q.       (By Mr. Wilmoth) I'll just read its  
3 title, if you wish. February 17, 2009. The title  
4 is Kansas Expert Response to Nebraska's Expert  
5 Report, quote, Estimating Computed Beneficial Use  
6 For Groundwater and Imported Water Supply under  
7 the Republican River Compact, close quotes.

8                   I notice your name appears on the top of  
9 that report. Were you the lead author of the  
10 report?

11          A.       No, I'm not the lead author of the report.

12          Q.       What is your involvement in that report?

13          A.       Well, I guess more of the overview. I am  
14 one who has been involved in both the accounting  
15 aspects, developing the accounting procedures during  
16 the settlement discussions, as well as being one of  
17 the team that was involved in the modeling  
18 committees. So mine was more sort of an overview,  
19 big picture, understanding of the issues. Some of  
20 the history that's included within this, but in terms  
21 of the detailed modeling sort of work and data work,  
22 Dale and Steve had more significant involvement  
23 there.

24          Q.       And that would be, for the record?

25          A.       Dale Book and Steve Larson.

1           Q.     Could you identify a primary author of  
2     that document if you had to?

3           A.     I would say Steve Larson is probably the  
4     lead author on this report.

5           Q.     Thank you.

6           A.     But Dale Book also had very significant  
7     input as well, so they're probably lead co-authors, I  
8     would say.

9           Q.     Before I interrupted you you were about  
10    to articulate your understanding of Nebraska's  
11    proposed changes.

12          A.     Right, and I was just going to borrow on  
13    some of what we state in the report. Well, I'm not  
14    finding it. I'll just make my attempt. The current  
15    use of the model is to determine the impacts of each  
16    state's groundwater pumping and the imported water  
17    supply credit. Each of those is done through,  
18    according to the accounting procedures that have been  
19    adopted, through the difference between a base run  
20    that is with reference to historic conditions and  
21    what I call an impact run that turns one of the  
22    stresses off an individual state's pumping or the  
23    groundwater imports, the imports from the plat  
24    system. Nebraska changes would replace that with  
25    additional model runs, additional differences and

1       then sort of a weighted average of all those  
2       different differences.

3           Q.     One of the things, I believe, in the  
4       summary or the first part of your report that I  
5       noticed is a statement to the effect that the  
6       current procedure provides a, quote, reasonable  
7       and appropriate result. I was hoping you could  
8       elaborate on your view of what is reasonable and  
9       appropriate in this case.

10          A.     Well, that language or at least very similar  
11       language was -- came out of the model report that was  
12       done by the modeling committee that developed the  
13       models, and it found that the procedures were  
14       something reasonable and appropriate, so therefore,  
15       that means that the -- you know, the groundwater  
16       depletions due to groundwater pumping for each state  
17       are reasonable and the imported water supply credit  
18       is reasonable and what is necessary to do a proper  
19       accounting under the compact and the FSS.

20          Q.     But is that the only reasonable and  
21       appropriate result, or might there be other  
22       mechanisms to achieve a reasonable and appropriate  
23       result?

24          A.     Well, it's the ones that the states agreed  
25       to and adopted.

1           Q.     But, of course, you're familiar with the  
2     arbitrator's decision which essentially allowed us  
3     to explore this issue and found that Nebraska was  
4     not bound by that?

5           A.     Well, I haven't studied his report, but my  
6     understanding is that he said if there was an error,  
7     he would explore fixing the error.

8           Q.     One of the things about the model that  
9     Kansas appears to value is the notion that the  
10    baseline has been calibrated.  Could you explain  
11    that?

12          A.     Sure.  Well, the base run of the model, you  
13    know, is composed of all the stresses that occur.  In  
14    other words, all the groundwater pumping of each  
15    states, as well as the imported water that comes next  
16    to the basin.  So it is the actual physical  
17    conditions that were experienced and reflected in the  
18    base flows that the modeling committee established as  
19    the targets for the models.  So, yeah, all those four  
20    different impacts are included in the base flows and  
21    make up the base condition, and again, when we  
22    calibrated the model, that was one of the primary  
23    calibration targets.

24          Q.     And so what was the model calibrated  
25    against?

1           A.     Well, primarily against these base flows  
2     that were developed from the stream gauge information  
3     by the modeling committee, as well as groundwater  
4     levels were, I think, the two primary calibration  
5     targets, as I understand them.

6           Q.     And what was the data set for that?

7           A.     I'm sorry?

8           Q.     What was the data set?  What was the  
9     period of record against which you calibrated?

10          A.     In the case of the stream flows, my  
11     recollection, the committee took every gauge that  
12     they had any significant record on and did the base  
13     flow separation and used it all.  There were 60-some  
14     gauges that were used within the model domain, is my  
15     recollection.

16          Q.     And is the period of record on that  
17     essentially 1918 to 2000?

18          A.     Yeah.  It went through the year 2000.  
19     That's correct.

20          Q.     Beginning in 1918?

21          A.     Well, yes.  The modeling period began in  
22     1918.  Obviously the gauges, many of them were not  
23     there, so they used whatever gauge record was  
24     available.

25          Q.     Okay.  Why is it so important to

1       calibrate the model against that data set?

2           A.     Well, that's the physical data that we have.

3           Q.     What is the value of the calibration?

4           A.     Well, I'm not a modeler, but I mean, a  
5     calibration is to, I guess, to validify, you know, to  
6     the extent possible, I guess, the model itself.

7           Q.     So is the idea to try and figure out if  
8     the model is reflecting some condition that  
9     actually occurred in time?

10          A.     Well, I think it's to cause the model, to  
11     the extent possible, to reflect that reality.

12          Q.     Okay. I'm asking these questions  
13     because it seems to be implicit in the report that  
14     the fundamental error in the Nebraska proposal is  
15     that it's attempting to use a baseline that can't  
16     be calibrated or hasn't been calibrated. Is that  
17     a fair assessment of the report?

18          A.     Well, it is certainly a key concern, I  
19     guess, or criticism of Nebraska's method that it uses  
20     a non-calibrated base as opposed to a calibrated  
21     base.

22                   MR. WILMOTH: Could we go off the  
23     record for two minutes.

24                   (Off-the-record discussion.)

25                   MR. WILMOTH: I was going to ask the

1 court reporter to just read the last question and  
2 answer so we can pick up from there.

3 (The requested portion of the record was  
4 read by the reporter.)

5 Q. (By Mr. Wilmoth) With regard to this  
6 issue of calibration, it seems to me that this  
7 period of record, 1918 to 2000, certainly includes  
8 a fair number of years that predate significant  
9 well development. Do you have any idea when  
10 significant development came into the basin,  
11 development came into the basin?

12 A. Well, some in the Fifties, but you know,  
13 Sixties and Seventies obviously was the -- some of  
14 the big years.

15 Q. So if a large portion of the calibration  
16 data set includes years that predate significant  
17 well development, is not a no pumping scenario at  
18 least consistent with a large number of those  
19 years?

20 A. Repeat that again.

21 Q. If you assume, as we talked about, that,  
22 let's say, significant well development came in in  
23 1965 or '70. There's an implied period within  
24 that range, within that scope of the calibration  
25 data set that did not involve groundwater use?



1           A.     Uh-huh.

2           Q.     And so if a scenario involves no pumping  
3     in Nebraska, isn't that within the range of the  
4     calibration data set?

5           A.     Well, you know, the early record, much of  
6     what you reference had little -- I mean, the gauges,  
7     a lot of them weren't available. The best data, I  
8     think, in the model is the later data for many  
9     reasons. We have a lot more -- we have a lot more  
10    gauges on line at that point, a lot better gauge  
11    data. We have a lot more groundwater level data.  
12    The other key factor that was used and calibrated is  
13    the groundwater level data, and we have much more  
14    groundwater level data available later in the record.  
15    So not all the record is as valuable. You know, they  
16    aren't equally valuable. Different parts of it, and  
17    so the later record provides a much richer set of  
18    surface water data, groundwater level data, and we  
19    are able to see the response of groundwater level and  
20    stream flows to, you know, to the key inputs of  
21    pumping and imports. And so I guess when we say the  
22    model went from '18 to 2000 and we calibrated, you  
23    know, I think the latter period was much -- more  
24    heavily used because that's where the data is.  
25    That's where the stresses are reflected.

1           Q.     Is there any reason to think, though,  
2     that groundwater levels prior to large scale  
3     development were all that different than they were  
4     when that development began?

5           A.     Say that again.

6           Q.     Is there any reason to believe that  
7     groundwater levels prior to large scale  
8     development were really any different than they  
9     were when that development began? Was there any  
10    significant stress, for example, on groundwater at  
11    that time?

12          A.     None to my knowledge. But again, our  
13    monitoring data going back in time, you know,  
14    especially pre-groundwater development is -- you  
15    know, it's not that extensive, so.

16          Q.     But it is true, if I understand you  
17    correctly, that a no pumping scenario is within  
18    the calibration period scope?

19          A.     Well, I guess I'm not certain.

20          Q.     Well, there was no pumping in 1918?

21          A.     There was no pumping in 1918, that's true,  
22    but you're inferring that there's -- that the model  
23    has, what the model is saying in 1918 has -- there's  
24    something of value back there. 1918 to, you know,  
25    1950, part of the model is equally valuable to the

1       latter part.

2           Q.     What I'm inferring is that the  
3       groundwater levels would not have changed  
4       dramatically between 1918 and say 1960. Do you  
5       agree with that inference?

6           A.     It seems a reasonable inference.

7           Q.     Okay. That's the best I can probably  
8       get, is reasonable. One of the things that is  
9       also an apparent difference between the states is  
10      this issue of linearity and non-linearities in  
11      the -- in certain sub-basins. Do you know what  
12      I'm referring to in that regard?

13          A.     Yes.

14          Q.     And I think -- I don't know what to ask  
15      you, but my understanding of the Kansas position  
16      is that certain non-linearities are acceptable?

17          A.     Non-linearities occur, yes.

18          Q.     And are those non-linearities okay with  
19      Kansas or are they within the range of reasonable  
20      and appropriate results?

21          A.     I guess I want you to define more what you  
22      mean by non-linear. I think -- what do you mean by  
23      non-linearities specifically?

24          Q.     I think, as you know, state of Nebraska  
25      has identified some non-linearities in the Beaver

1 Creek Sub Basin, for example.

2 A. Between what and what?

3 Q. Well, are you familiar with Mr. Ofelt's  
4 report entitled Estimating Computed Beneficial  
5 Consumptive Use For Groundwater, Imported Water  
6 Supply under the Republican River Compact?

7 A. I have seen it, yes.

8 MR. DRAPER: Tom, you're referring  
9 to the field report from January 20th as opposed  
10 to the August 6th?

11 MR. WILMOTH: Yes.

12 Q. (By Mr. Wilmoth) I guess I would direct  
13 you to your report.

14 A. Okay.

15 Q. Page 7. Bottom of the second full  
16 paragraph, last sentence, if you could read that.

17 A. I'm sorry, which paragraph?

18 Q. Second full paragraph, last sentence.

19 A. Okay. The one, the paragraph starts, "There  
20 is no disagreement"?

21 Q. Correct.

22 A. You want me to read the last sentence?

23 Q. Yes, please.

24 A. "It is not a question of whether these  
25 non-linear effects exist, but whether they should be

1       attenuated or eliminated as Nebraska -- as suggested  
2       by Nebraska."

3           Q.       Which effects are you referring to in  
4       that sentence?

5           A.       All right. Well, the first sentence reads,  
6       "There's no disagreement by any of the states that  
7       there are non-linear effects produced by the model  
8       due to the relationship between groundwater pumping,  
9       evapotranspiration and stream effects," so the  
10      linearity then, I think, is primarily between  
11      groundwater pumping and it's stream effect. So  
12      again, what was your question again?

13          Q.       Well, it appears that from this  
14      paragraph Kansas believes that certain  
15      non-linearities are acceptable, or in your words  
16      of your report, reasonable and appropriate. Is  
17      that correct?

18          A.       That's correct.

19          Q.       Is there any limitation on that? In  
20      other words, what would be unreasonable or  
21      inappropriate in the way of such non-linearities?

22          A.       Good question. I guess all I can tell you  
23      is that the modeling committee and we find that the  
24      model as was calibrated and used, we believe, is  
25      reasonable.

1           Q.     You notice that some of the non-linear  
2     components were, quote, idealized, close quote.  
3     Can you explain what that means and why it was  
4     done?

5           A.     Well, one example, I think, is in the  
6     evapotranspiration function. As I recall, it was  
7     idealized, I think. It was assumed that a certain  
8     depth below ground surface, when the model predicted  
9     that the water level was at a certain elevation with  
10    respect to the stream bed, that evapotranspiration  
11    would start at a certain elevation, increase linearly  
12    until a lesser elevation and then reach its maximum  
13    or minimum at that point, so.

14          Q.     And why was that done?

15          A.     Well, it was the best method that the  
16    committee could find to compute that, that part of  
17    the water budget, so.

18          Q.     And was the idea to try and replicate an  
19    accurate estimation of evapotranspiration?

20          A.     Yeah, it follows theory that, you know,  
21    three out of five have some zone that they operate  
22    within and if the water level is at the top of that  
23    zone, the evapotranspiration is at maximum, and after  
24    it drops below the root zone, then it ceases.

25          Q.     If I understand the report correctly,

1     one of your criticisms is that the concept of  
2     running essentially all pumping off and then one  
3     state's pumping on is unrealistic. Is that  
4     correct?

5         A.     Well, we believe it is not as good an  
6     estimate as the current procedures.

7         Q.     Why is that?

8         A.     Because we're constructing -- well, again,  
9     as I think you were inferring at the beginning of  
10    this, it's our view that the calibrated base run is  
11    what we know best, and therefore, it's for the best  
12    measuring point to start from.

13        Q.     And we have established that the base  
14    run includes a large number of years where there  
15    was no groundwater pumping. Correct?

16        A.     Well, I mean, we don't use that in -- I  
17    mean, we built a model using that record, but now we  
18    construct it. You know, we use the model year by  
19    year, so I guess I'm not sure how that predevelopment  
20    period really informs us.

21        Q.     Well, is the -- is it your expert  
22    opinion that it is unrealistic to assume that  
23    there's no groundwater pumping going on in the  
24    basin as a baseline?

25        A.     It's my opinion that the best base to use is

1 the calibrated base as opposed to one that's sort of  
2 manufactured.

3 Q. Is it impossible to calibrate the base  
4 that Nebraska is referring to?

5 A. I believe so.

6 Q. Can't be done?

7 A. We don't have the records.

8 Q. If it could be calibrated, would that  
9 change your mind?

10 A. I'm not sure.

11 Q. In your experience, have you ever  
12 conducted a run with Nebraska pumping off and  
13 essentially everything else on?

14 A. Say that again. Nebraska off and everything  
15 else?

16 Q. Everything else on, all their stresses  
17 on.

18 A. Everything on and Nebraska off. Well, that  
19 is one of the runs done under the compact accounting,  
20 if I'm hearing you correctly.

21 Q. That's what I'm asking. Is that a run  
22 done?

23 A. That is a run done, yes.

24 Q. And under that scenario, that assumes  
25 that imported water supply is a stress on the



1 system, a positive stress, if you will?

2 A. That's correct.

3 Q. Okay. How realistic is that scenario?

4 A. Well, it's the best that we, in my opinion,  
5 that we can construct by which to evaluate Nebraska's  
6 pumping impact.

7 Q. Are you familiar with the concept of  
8 additivity?

9 A. Well, I have seen the references in Ahfeld's  
10 report.

11 Q. And how do you understand that concept?

12 A. As I understand it he -- the principle of  
13 additivity is that the sum of the individual impacts  
14 should add up to the difference between all on and  
15 all off.

16 Q. And what's your opinion of that concept  
17 or that principle?

18 A. Well, I think our expert report expresses  
19 that opinion that it takes as an assumption that all  
20 on versus all off is the true measure, true and best  
21 measure.

22 Q. Uh-huh.

23 A. And I don't accept that as the true and best  
24 measure.

25 Q. Mr. Barfield, you'll recognize this from

1       your other deposition. For the record, I'm  
2       crossing out this prior tab number from the other  
3       deposition and would ask you to mark that as a new  
4       exhibit.

5               (Whereupon, Barfield Deposition Exhibit  
6               Number 11 was marked for  
7               identification by the reporter.)

8       Q.     (By Mr. Wilmoth) Are you familiar with  
9       this document?

10      A.     I have seen this before, yes.

11      Q.     I'm trying to reconcile the statement  
12     you just made with the discussion in this document  
13     of something called the virgin water supply  
14     metric, which is discussed in the fourth paragraph  
15     of the second page of this document.

16      A.     It starts with the ultimate goal.

17      Q.     Yes. First question is, can you explain  
18     what the virgin water supply metric is and how you  
19     thought it should be utilized at the time of this  
20     paper, which is September 18, 2007?

21      A.     Well, as I recall, anyway, the virgin water  
22     supply metric essentially is a difference between the  
23     base run and a run with all the stresses off.

24      Q.     So is this the same thing that we were  
25     just talking about a minute ago, wherein I think I

1       heard you say that you reject the premise of the  
2       virgin water supply metric?

3           A.     Well, to answer your second question -- I  
4       believe it is the same as -- well, it is a measure of  
5       the difference between all on and all off. Its  
6       purpose in this memorandum is not necessarily stating  
7       that this is the answer or the correct answer. At  
8       this particular time we were critiquing another  
9       Nebraska proposal and critiquing it showed that their  
10      proposal at that time was further away from this  
11      metric than the compact, and so we used it to say  
12      that, you know, that particular proposal did not  
13      perform well.

14          Q.     So --

15          A.     In fact, I think it was like three times  
16      further off, or something in that range.

17          Q.     So the Nebraska alternative was improper  
18      because it violated or deviated substantially from  
19      this metric?

20          A.     That was the rationale.

21          Q.     And do you understand that to be  
22      essentially the same metric that Dr. Ahlfeld is  
23      using in his report now? And if not, what's the  
24      difference?

25          A.     Well, I haven't compared these numbers with

1 his numbers, but they appear to be the same metric.

2 Q. And do you have an opinion on whether  
3 Nebraska's proposal as expressed in the Ahlfeld  
4 report, for lack of a better word, passes this  
5 metric or meets this metric?

6 A. Well, I think the Ahlfeld report, as I  
7 understand it, assumes that the metric is the right  
8 answer and goes about finding a mathematical way to  
9 get there.

10 Q. And on September 18 of 2007 did you not  
11 agree with that?

12 A. We did not in this document say that it was  
13 the right answer and abdicate moving to using such a  
14 procedure. We were just saying Nebraska's proposal  
15 at that time, you know, produced a result that was  
16 further away from that metric than the current  
17 procedures and, therefore, should be dismissed.

18 Q. The first sentence of that paragraph  
19 following the one you referred to, if you could  
20 read that, I'd appreciate it.

21 A. This measure does provide a metric for  
22 comparing accounting method agreed to in the  
23 settlement with Nebraska's alternative accounting  
24 proposal.

25 Q. Thank you. I'd like to refer you to the

1 next exhibit, which is a paper dated January 4,  
2 2008 by Mr. Perkins and Larson. This will be  
3 Exhibit 12.

4 (Whereupon, Barfield Deposition Exhibit  
5 Number 12 was marked for  
6 identification by the reporter.)

7 Q. (By Mr. Wilmoth) Are you familiar with  
8 this document, and if so, could you identify it  
9 for us?

10 A. Yes. I am familiar with the document and  
11 I'll read its title. Attachment 5: RRCA groundwater  
12 model analysis (revised) Impact of Nebraska Pumping  
13 and Proposed Remedy by Samuel P. Perkins and Steven  
14 P. Larson, January 4, 2008.

15 Q. I direct your attention to Page 4 of  
16 that document. The first full paragraph at the  
17 top. If you could read that. You don't need to  
18 read it aloud. Just for your own information.

19 A. Okay. Yes.

20 Q. This discussion in this paragraph, how  
21 does that discussion relate to this virgin water  
22 supply metric we were talking about, if at all?

23 A. It doesn't.

24 Q. Okay. Can you explain for us what these  
25 conditions mean? I believe there's a no Nebraska

1 pumping case.

2 A. Well, the no Nebraska pumping case is the  
3 case that is used to determine Nebraska's groundwater  
4 depletions, its run and then compared with the base  
5 run and the stream flows predicted by each run are  
6 subtracted and that's the impact to spring flow from  
7 pumping.

8 Q. In your opinion, is either the no  
9 Nebraska pumping case sort of -- I think it's  
10 called a proposed remedy case, a reflection of  
11 actual conditions in the basin today?

12 A. Again, repeat that.

13 Q. Is it -- in your opinion, is the no  
14 Nebraska pumping case or the proposed remedy case  
15 a reflection of actual conditions in the basin?

16 A. Well, this paragraph and paper is describing  
17 future scenarios that were constructed by the state  
18 of Kansas to evaluate potential future Nebraska  
19 groundwater depletions under essentially continued  
20 status quo pumping or reductions prescribed by the  
21 remedy. So these are projections. I'm not sure I  
22 answered your question.

23 Q. That's all right. What is the general  
24 impact of the Nebraska proposal with the sub-basin  
25 level?

1           A.     I'm sorry.  So we're back to Ahlfeld's  
2     proposal?

3           Q.     Yes.

4           A.     Repeat the question.

5           Q.     What's the general impact of that  
6     proposal on a sub-basin level?

7           A.     So how does it impact the sub-basin  
8     accounting?

9           Q.     Uh-huh.

10          A.     I think it has two principal effects, as I  
11     understand it.  That the largest effect is actually  
12     on the quantification of the import credit, and it  
13     generally increases that over the current  
14     methodology.  With respect to groundwater depletions,  
15     it tends to move them into the -- move effects into  
16     the tributaries and upstream, particularly during dry  
17     periods.  I think it also increases generally the  
18     magnitude of the tributary effects.

19          Q.     So is it fair to say that with regard to  
20     sub-basins it refines the current calculations?

21          A.     It changes them.

22          Q.     Uh-huh.

23          A.     Refines, I guess, is in the eye of the  
24     beholder.

25          Q.     Certainly.  Do you have any opinion on

1       why Nebraska might want to ensure accuracy in  
2       accounting at the sub-basin level?

3           A.     Again, repeat the question.

4           Q.     Do you have any reason or do you have  
5       any understanding of why Nebraska might be  
6       uniquely interested in defining impacts at the  
7       sub-basin level?

8           A.     Well, I think we all have some interest in  
9       that. I mean, the whole process -- I mean, the  
10      process does define impacts on a sub-basin level  
11      currently.

12          Q.     And do you agree that it's important to  
13      have accurate sub-basin calculations?

14          A.     Well, they're part of the accounting. They  
15      are tests that are dependent on the sub-basins,  
16      although those tests actually primarily fall to  
17      Colorado and Kansas. State of Nebraska does not have  
18      a tributary test in the sense that the other two do.  
19      It has the ability to combine its tributaries,  
20      whereas Kansas and Colorado both have to stand for a  
21      specific tributary test that Nebraska does not. But  
22      obviously, it's a piece of the bigger accounting.

23          Q.     The current accounting procedures, as I  
24      understand it, result in some residual values at  
25      the sub-basin level. Is that correct?



1           A.     I'm not sure what you're speaking about.

2           Q.     I'd refer you to the Ahlfeld paper  
3     again.

4           A.     Okay.

5           Q.     One of the things that Dr. Ofelt  
6     discusses is the elimination of certain residual  
7     values as a result of the Nebraska proposal which  
8     are currently just kind of unaccounted for in the  
9     existing accounting.

10          A.     Again, I'm not sure.

11          Q.     I'll find it in just one moment.  Why  
12     don't we take a three-minute break and we'll -- or  
13     five-minute break and we'll come back and finish  
14     up.

15                     (Brief recess taken.)

16          Q.     (By Mr. Wilmoth) Mr. Barfield, when we  
17     broke I mentioned the term residual, and my  
18     question essentially was, are you familiar with  
19     the concept of these residuals?  I would direct  
20     your attention to Page 46 of the Ofelt paper.  
21     Midway through there's a discussion of reducing  
22     certain residual values to zero.  Are you familiar  
23     with that discussion?

24          A.     Yes.  Yeah, the residual he defines as the  
25     difference between this virgin water supply,

1 groundwater, which I believe is the difference  
2 between the all on versus all off runs, minus the  
3 individual components, you know, computed according  
4 to the current runs.

5 Q. So my understanding -- or let me ask you  
6 this. Is it your understanding that with the  
7 current runs, which I believe are five in total.  
8 Is that correct?

9 A. Yes. Five runs.

10 Q. In certain cases you end up with these  
11 residual values?

12 A. Well, there are no residual values in the  
13 current process. He defines the residual as the  
14 difference in the current method and this new pair of  
15 runs. So there's no residual in the current  
16 accounting procedures, at least. I mean, residual as  
17 he defines it is something outside the current  
18 compact accounting procedures.

19 Q. Well, the residual value, as it seems to  
20 be the case in this discussion, is this  
21 essentially water that's unaccounted for, if you  
22 will, after the five runs?

23 A. Well, it's the difference in a pair of runs  
24 that all on versus all off.

25 Q. Uh-huh.

1           A.     And the four individual component runs.  
2     That's true.

3           Q.     And do you understand the Nebraska  
4     proposal to be -- to make essentially 11  
5     additional runs above and beyond the five?

6           A.     It's a number. I can't confirm 11 at this  
7     moment.

8           Q.     And one of the values that Dr. Ofelt  
9     appears to identify from this method is it would  
10    eliminate these residuals?

11          A.     Yes, as he defines them, that's true.

12          Q.     And do you see any value in doing so?

13          A.     Well, only, again, if the -- his assumption  
14    that the virgin water supply groundwater is the true  
15    and correct value.

16          Q.     Is this the virgin water supply metric  
17    again, what we're getting back to?

18          A.     Yes.

19          Q.     Okay. So the virgin water, if the  
20    virgin water supply metric is a legitimate test of  
21    the validity of a particular alternative, then the  
22    closer you get to zero, the better the  
23    alternative. Is that an accurate statement?

24          A.     If you take that premise as true, yes.

25          Q.     Thank you. Is there any set of changes

1 to the accounting procedures that you think are  
2 within the realm of reasonable and appropriate, or  
3 is the position of the state of Kansas or your  
4 expert opinion that what was agreed to was agreed  
5 to and there are no changes that are reasonable or  
6 appropriate?

7 A. Well, I can't categorically say there's  
8 nothing other than what you agreed to that we could.  
9 I guess it's our opinion that the Nebraska method is  
10 not something we think is an improvement or could  
11 agree to.

12 Q. Okay.

13 A. For reasons, you know, in the report, not  
14 all of which we have talked about here.

15 MR. WILMOTH: I think that's all we  
16 have got, John. Pete?

17 MR. AMPE: Actually I do have a  
18 couple of questions. Let me look through my  
19 notes. I don't have much.

20 CROSS-EXAMINATION

21 BY MR. AMPE:

22 Q. But right when you first started talking  
23 to counsel, when you started, everyone started  
24 using terms like compact, final settlement  
25 stipulation, accounting procedures. I just want

1 to clarify a few things. That the accounting  
2 procedures are Exhibit C, I think, to the final  
3 settlement stipulation. Is that correct?

4 A. Well, no longer.

5 Q. They have been modified?

6 A. Yes, accounting -- yes. The Appendix C were  
7 adopted by the compact administration and have been  
8 subsequently modified on more than one occasion, but  
9 that's correct.

10 Q. Obviously, then, the RRCA when they  
11 agreed to modify the accounting procedures?

12 A. That's right.

13 Q. Can the RRCA modify the compact?

14 A. I don't believe so.

15 Q. Okay. Can the RRCA modify the final  
16 settlement stipulation?

17 A. I don't believe so.

18 Q. Okay. So the accounting procedures were  
19 intended to implement the final settlement  
20 stipulation?

21 A. That's correct.

22 Q. Okay. And so if there's a conflict  
23 between what the accounting says and the final  
24 settlement stipulation, then the final settlement  
25 stipulation really should control?

1           A.     There shouldn't be a conflict between them.

2           Q.     Okay.  If that is true, there shouldn't  
3     be, but what if there is?  I'm not going to ask  
4     you if there is one, but if there was one, the  
5     final settlement stipulation.

6                     MR. DRAPER:  I would say that's a  
7     legal question, Pete, about what control between  
8     two legal documents if someone were to find a  
9     conflict would be a legal question.

10          Q.     (By Mr. Ampe)  How about conflict  
11     between the accounting procedures and the compact?

12                     MR. DRAPER:  Again, that's a legal  
13     question.

14                     MR. AMPE:  Okay.  That's all I have.

15                     MR. WILMOTH:  I have got just a  
16     couple additional things that are not related to  
17     the CBC paper I forgot.  If you don't mind, we'll  
18     probably spend another ten minutes on that.  We  
19     can make up the time elsewhere with Mr. Pope, if  
20     that's all right.  Is that acceptable?

21                     MR. DRAPER:  Sure.

22                             REDIRECT EXAMINATION

23     BY MR. WILMOTH:

24          Q.     One of the issues in this matter,  
25     Mr. Barfield, is this issue of how the averaging

1 works in the accounting procedures under the FSS.

2 Is it your -- what is your understanding of the  
3 average concept in the FSS, as a technical matter?

4 A. Well, there are numbers in a table that  
5 says, you know, we have these five years or two  
6 years, and we create -- you know, the tests of  
7 compliance is to keep that average positive, in  
8 essence, if I'm understanding what you're asking.

9 Q. That is.

10 A. All right. So compliance is having a  
11 positive average. Noncompliance is having a negative  
12 end result.

13 Q. So positive average would be when you  
14 say average, you mean two year or five year or  
15 conceivably three year?

16 A. Correct.

17 Q. Under certain circumstances?

18 A. Correct.

19 Q. Okay. And so is it your understanding  
20 as a technical matter that when you're calculating  
21 these averages, a state could be over -- could  
22 exceed allocation in one year, but be below  
23 allocation in one year by an equivalent amount and  
24 have essentially a zero average?

25 A. Uh-huh.

1           Q.     And so conceivably, if one state  
2     overused allocation by 10,000 acre feet in 2010,  
3     underutilized its allocation in 2011 by 10,000  
4     acre feet, the two year running average for those  
5     two years would be zero?

6           A.     Yes.

7           Q.     And there would be, I guess in the words  
8     of -- I think your earlier words, compliance in  
9     that case, that particular state would not be out  
10    of compliance?

11          A.     For that test, yes.

12          Q.     I'd like to hand you what I'll have  
13    marked as Exhibit 13.

14                 (Whereupon, Barfield Deposition Exhibit  
15                 Number 13 was marked for  
16                 identification by the reporter.)

17          Q.     (By Mr. Wilmoth) You don't need to  
18    accept this for purposes of this next question,  
19    but I will represent to you that this document was  
20    retrieved from the state of Kansas in January when  
21    Nebraska went down. Do you recognize this  
22    document?

23          A.     Yes, I do.

24          Q.     Could you describe it or identify it,  
25    please?



1           A.     Sure. The title is Talking Points for  
2     2000 -- I'm sorry, August 13, 2008, RRCA Annual  
3     Meeting.

4           Q.     And is this a document that you prepared  
5     or someone in your office prepared?

6           A.     Well, I had some assistance, but, you know,  
7     it's something that I'm responsible for.

8           Q.     And what did you do with this document?

9           A.     In large measure, this was comments that  
10    were made at that particular meeting by myself under,  
11    you know, under one of the items where we sort of  
12    talked about Nebraska's noncompliance.

13          Q.     Was this a public meeting?

14          A.     Yes, it was.

15          Q.     And was that meeting sponsored by the  
16    state or --

17          A.     This was one of the annual meetings of the  
18    compact administration.

19          Q.     Okay.

20          A.     Right.

21          Q.     Thank you. Second bullet point, second  
22    sentence, if you could read that, please.

23          A.     The stipulation? "Recognize that it would  
24    take time for Nebraska and Colorado to come in to  
25    compliance."

1 Q. What did you mean by that?

2 A. Well, the next sentence explains it more  
3 fully. Thus the FSS included an implementation  
4 schedule, which was Appendix B to the FSS, that  
5 delayed the first possible water short compliance  
6 period until 2005, 2006 and the first normal year  
7 compliance until 2007 based on the five years 2003 to  
8 2007.

9 Q. So getting back to our earlier  
10 discussion about averaging and compliance, when  
11 you said that the FSS delayed the first possible  
12 water short compliance period until 2005, 2006,  
13 did that mean that compliance was to be measured  
14 based on that average of '05 and '06, in your  
15 view?

16 A. Yes.

17 Q. Okay. And at the time of this writing,  
18 were you of the opinion that Nebraska needed to  
19 comply with the compact in '05 and '06 or needed  
20 to comply on average?

21 A. Okay. Say that again.

22 Q. At the time of this writing were you of  
23 the opinion that Nebraska needed to remain within  
24 its allocation, within both 2005 and 2006 or  
25 simply on average?

1           A.     On average.

2           Q.     And then the next bullet point, if you  
3 could read that, please.

4           A.     Well, "The FSS gave the states a great deal  
5 of latitude on how to come into compliance.  
6 Compliance is not optional. The tests of compliance  
7 are very clear."

8           Q.     And the tests for compliance is what we  
9 just talked about with the averaging. Is that  
10 correct?

11          A.     Yes. That's one of them, yeah. That's the  
12 one that was at issue at this meeting.

13          Q.     Okay. And with regard to, quote, a  
14 great deal of latitude, close quote, what did you  
15 mean by that?

16          A.     Well, the FSS does not prescribe how, you  
17 know, that a state had to eliminate surface water use  
18 or groundwater use. You know, it didn't say what  
19 basin it had to do it in. It just said here's the  
20 tests of compliance. Here's each state's allocations  
21 and go and use yours, but meet these tests.

22          Q.     And then if you go down -- I have got to  
23 count these bullets. Seven bullets down, please.  
24 The bullet begins "Nebraska failed"?

25          A.     Right. Okay.

1 Q. There's a bolded section there. Could  
2 you please read that?

3 A. Yeah. "For this period Kansas calculations  
4 show that Nebraska overused 84,000 acre feet -- used  
5 84,000 acre feet more than allocation above Guide  
6 Rock creating a shortage of roughly the same amount  
7 to Kansas."

8 Q. Okay. So earlier you talked about or we  
9 discussed the concept of averaging for purposes of  
10 determining compliance. Here in this section you  
11 seem to be indicating that there's an annual  
12 compliance requirement. Am I inferring too much?

13 A. Well, the 84,000 is the sum of the two  
14 years, if that's what you're asking.

15 Q. Okay. So although earlier we talked  
16 about the compliance test being a two year  
17 average, your concern later on down was 84,000  
18 acre feet which was a total?

19 A. That's true.

20 Q. And so is it your understanding under  
21 the compact that Nebraska is responsible for that  
22 total?

23 A. Yes.

24 Q. Okay. And how do you derive that?

25 A. Well, I think the average is just a test of

1 compliance or not.

2 Q. So the position is that once the  
3 compliance trigger is measured, you then look  
4 backward and add up the individual years of the  
5 average?

6 A. Well, the test is an average in terms of are  
7 you in compliance or not, but you know, the sum of  
8 the -- I mean, the violation is the sum of the years,  
9 which I guess in this case since it's a two year  
10 average is double the average. If we were doing a  
11 five year average --

12 Q. Let me give you an example, if I may.

13 A. Yeah.

14 Q. Let's assume for the sake of this next  
15 question that Nebraska's overuse in 2005 was  
16 50,000 acre feet and that in 2006 it underused  
17 50,000 acre feet. The average would be zero.

18 A. Right.

19 Q. Which a moment ago I believe we said  
20 resulted in compliance.

21 A. Right.

22 Q. And therefore, there would be no compact  
23 violation?

24 A. For that test, that's right.

25 Q. So the 50,000 acre foot depravation in

1       2005 would become irrelevant. In other words,  
2       Kansas would not be entitled to compensation for  
3       that?

4           A.       If that's -- I think that's right.

5           Q.       So now let me change this example just  
6       briefly to make sure I understand your assessment.  
7       2005, Nebraska overutilizes allocation by 50,000  
8       acre feet. I'm sorry, 50,001 acre feet.

9           A.       Okay.

10          Q.       The number is five zero zero zero one.

11          A.       Got it.

12          Q.       I think you know where I'm going.

13          A.       Yeah.

14          Q.       2006 it under utilizes by 50,000 acre  
15       feet. If I understand your position, it is that  
16       although the average noncompliance or the average  
17       for purposes of determining compliance is one-half  
18       of one acre foot, it's your opinion that Nebraska  
19       would be made to pay in '05 for 50,001 acre feet?

20          A.       Okay. I guess I'm not clear with your  
21       example. So your first example was 50,000 minus  
22       followed by 50,000 plus, it's zero.

23          Q.       Correct?

24          A.       You're in compliance.

25          Q.       Correct.

1           A.     Your second example is minus 50,001, plus  
2     50,000.

3           Q.     Correct.

4           A.     So your two year average is negative by  
5     roughly a half an acre foot.

6           Q.     Okay.

7           A.     So you're saying what is the total?

8           Q.     What does the FSS say about 2005, in  
9     your opinion? Is Nebraska compensating Kansas for  
10    losses in 2005? And if so, to what extent?

11          A.     Well, actually, I don't know that the FSS  
12    says.

13          Q.     Okay. So for purposes of calculating  
14    compliance in your view and your expert paper and  
15    for purposes of determining damages in this  
16    proceeding, if I'm understanding your earlier  
17    statements, the critical thing is whether Nebraska  
18    is in compliance or not, and then once you have  
19    determined that, you go back and you add up all  
20    the numbers by which Kansas might have been  
21    deprived water.

22                   MR. DRAPER: You're asking these  
23    questions in terms of his engineering  
24    understanding?

25                   MR. WILMOTH: I'm not asking for a

1 legal conclusion about it, John. What I'm asking  
2 is when Mr. Barfield tries to determine how much  
3 in the hole, so to speak, Nebraska is as a  
4 technical matter in support of demands, how that  
5 calculation is made.

6 Q. (By Mr. Wilmoth) And my earlier example  
7 was negative 50,000 in '05, positive 50,000 in  
8 '06. The answer was compliance. No remedy.  
9 Correct, if you're in compliance?

10 A. Uh-huh.

11 Q. Now my question is, 50,001 acre foot in  
12 '05 -- 50,000 negative. Fifty thousand positive  
13 in '06. You are noncompliant on the two year  
14 average. What damages or what water depravation  
15 are you considering to be compensable under the  
16 FSS?

17 MR. DRAPER: Let me just make sure I  
18 understand your question so that the record is  
19 clear here. In other words, if you add the  
20 positive in your second example, 50 and the  
21 negative 50,001, the sum of those two numbers for  
22 the two years is one acre foot minus one?

23 MR. WILMOTH: And the average is --

24 MR. DRAPER: And the average is a  
25 minus half acre foot per year?



1                   MR. WILMOTH: Correct. And if I  
2 understood Mr. Barfield's statement earlier about  
3 this particular document, it is that the position  
4 of Mr. Barfield and the state of Kansas that  
5 Nebraska would be required to compensate Kansas to  
6 the tune of 50,001 acre feet because of the two  
7 year average was negative.

8                   MR. DRAPER: And the sum was one  
9 acre foot negative.

10                  MR. WILMOTH: The sum was one.

11                  THE WITNESS: Minus one.

12           Q.       (By Mr. Wilmoth) Do you understand my  
13 question?

14                  MR. DRAPER: Do you understand the  
15 question?

16           A.       I think so. Well, first of all, the FSS  
17 doesn't speak to damages. It just speaks to here's  
18 the test of compliance, and so in your second  
19 illustration, Nebraska is out of compliance.

20           Q.       Correct.

21           A.       And yeah, I would say that the -- I mean,  
22 the point being made in the record here was that, you  
23 know, the sum of the negative, not just the average,  
24 is what Kansas was harmed.

25           Q.       Okay. So under my example -- this is a

1       very crucial point. I want to be very clear about  
2       this. Under my example, is it your opinion that  
3       Kansas would be entitled to compensation either  
4       through water or damages for .5 acre feet times  
5       two or for 50,001 acre foot?

6           A.     Yeah. Your example is not one I've faced  
7       here, so I'm not sure -- you know, I don't know that  
8       I have an answer. Here I'm saying, though, you had  
9       two negatives and it's the sum of the negatives that  
10      is the violation, or at least what Kansas needs to be  
11      reconciled.

12          Q.     I'm going to keep on this a little bit.  
13      Is there a scenario that you could consider that  
14      is similar to the one I'm concocting, which is  
15      essentially that the average is very small, but  
16      any one particular year could be very large?

17          A.     I'm sure there is.

18          Q.     And when you talk about compliance and  
19      making up for lost water, I need to know what  
20      you're talking about. You don't have the answer  
21      to that?

22          A.     I don't have the answer to that.

23          Q.     All right. That's all we have got.  
24      Thank you.

25                   MR. DRAPER: We'll take a short

1 break and decide if there's any redirect.

2 (Brief recess taken.)

3 MR. DRAPER: No further questions.

4 (Witness excused.)

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\_\_\_\_\_ .

DAVID W. BARFIELD, P.E.

11

12

13 STATE OF \_\_\_\_\_)

) SS:

14 COUNTY OF \_\_\_\_\_)

15

16 Subscribed and sworn to before me this\_\_\_\_\_

day of \_\_\_\_\_, 2009.

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NOTARY PUBLIC

23

24 My Commission Expires: \_\_\_\_\_.

25 In re: Non-Binding Arbitration

C E R T I F I C A T E

I, JANE A. BLACKERBY, a Certified Court Reporter within and for the State of Missouri, hereby certify that the within-named witness was first duly sworn to testify the truth, and that the deposition by said witness was given in response to the questions propounded, as herein set forth, was first taken in machine shorthand by me and afterwards reduced to writing under my direction and supervision, and is a true and correct record of the testimony given by the witness.

I further certify that I am not a relative or employee or attorney or counsel of any of the parties, or relative or employee of such attorneys or counsel, or financially interested in the action.

WITNESS my hand and official seal at Kansas City, Jackson County, Missouri, this 28th day of February, 2009.

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JANE A. BLACKERBY, RPR, CCR No. 877

Certified Court Reporter